

CLAIMS

1. A method of battery monitoring including the steps of:

- a) acquiring a battery voltage measurement from the battery;
- 5 b) acquiring a time measurement associated with the battery voltage measurement acquired in step a);
- c) determining a scaled voltage value by scaling the battery voltage measurement made in step a) with respect to a predetermined end voltage;
- 10 d) determining a scaled time value from the scaled voltage value determined in step c) in accordance with a predetermined battery characteristic; and
- e) obtaining a reserve time from the scaled time value determined in step d), the reserve time being indicative of the difference between
15 the time measurement acquired in step b) and an end time associated with the predetermined end voltage.

2. A method of battery monitoring including the steps of:

- a) acquiring a battery voltage measurement from the battery;
- 20 b) acquiring a time measurement associated with the battery voltage measurement acquired in step a);
- c) determining a scaled voltage value by scaling the battery voltage measurement made in step a) with respect to a start voltage and a predetermined end voltage;
- 25 d) determining a scaled time value from the scaled voltage value determined in step c) in accordance with a predetermined battery discharge characteristic; and
- e) obtaining an absolute time value from the scaled time value determined in step d).

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3. A method according to claim 2 wherein the absolute time value is a reserve time indicative of the difference between the time measurement acquired in step b) and an end time associated with the predetermined end voltage.

- 4.A method according to any of the preceding claims further including performing one or more additional repeats of steps a)-e) during a single battery discharge.
- 5 5.A method according to claim 4 wherein step e) includes the steps of: e)i) determining the difference between a lower time measurement and an upper time measurement; e)ii) determining the difference between a pair of scaled time values associated with the lower and upper time measurements; and e)iii) determining the ratio of the differences
10 determined in steps e)i) and e)ii).
- 6.A method according to claim 5 wherein the lower and upper time measurements change for each repeat of step e).
- 15 7.A method according to claim 6 wherein the lower and upper time measurements are associated with a pair of adjacent repeats.
- 8.A method according to claim 5 or 6 wherein the lower time measurement is the same for each repeat of step e), and the upper time measurement
20 changes for each repeat of step e).
- 9.A method according to any of claims 4 to 8 wherein the battery voltage measurements include a measured start voltage, and wherein the scaled voltage value is determined in step c) by scaling the battery voltage
25 measurement with respect to the measured start voltage and the predetermined end voltage.
10. A method according to any of the preceding claims further including the step of receiving and storing the predetermined end voltage.
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11. A method according to claim 10 further including the step of re-scaling the battery discharge characteristic in accordance with the stored end voltage.

12. A method of characterising a battery including:

- a) acquiring a plurality of battery voltage measurements from the battery, the battery voltage measurements including a start voltage and an end voltage;
- 5 b) acquiring a plurality of time measurements, each time measurement being associated with a respective battery voltage measurement, the time measurements including an end time associated with the end voltage;
- c) determining a plurality of scaled voltage values by scaling each battery voltage measurement with respect to the start voltage and the end voltage;
- 10 d) determining a plurality of scaled time values by scaling each time measurement with respect to the end time; and
- e) storing a battery discharge characteristic indicative of the relationship between the scaled voltage values and the scaled time values.
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13. A method according to any of claims 1 to 11 wherein the predetermined battery characteristic used in step e) has been obtained by a method according to claim 12.

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14. A method according to claim 13 further including the step of obtaining the predetermined battery characteristic by a method according to claim 11.

25 15. Software for configuring a system to perform a method according to any of the preceding claims.

16. A computer readable medium carrying software according to claim 15.

30 17. A system configured to implement the method of any of claims 1 to 14, the system including a sensor for acquiring the battery voltage measurements; a timer for generating the time measurements; and a processor for performing steps c) to e).

18. A system according to claim 17 further including a store for storing the result of step e).
- 5 19. A system according to claim 17 or 18 further including one or more output devices for outputting the result of step e).
20. A system according to claim 19 wherein the output device is a display unit.
- 10 21. A storage medium containing a battery discharge characteristic which has been determined by the method of any one of claims 12-14.